

## **REMARKS**

Reconsideration and withdrawal of the rejections of the claimed invention is respectfully requested in view of the amendments, remarks and enclosures herewith, which place the application in condition for allowance.

### **I. STATUS OF CLAIMS AND FORMAL MATTERS**

Claim 17 has been amended to delete the first sentence. Claims 4-9, 16 and 17 are still pending in this application upon entry of the amendment. Claims 8, 9 and 17 have been amended to address the duplicative claim objection made in the previous office action.

No new matter has been added by this amendment.

It is submitted that the claims, herewith and as originally presented, are patentably distinct over the prior art cited in the Office Action, and that these claims were in full compliance with the requirements of 35 U.S.C. § 112. The amendments of the claims, as presented herein, are not made for purposes of patentability within the meaning of 35 U.S.C. §§§§ 101, 102, 103 or 112. Rather, these amendments and additions are made simply for clarification and to round out the scope of protection to which Applicants are entitled.

### **II. CLAIM OBJECTIONS HAVE BEEN OVERCOME**

The first sentence of claim 17 has been deleted which addresses the objection.

### **III. THE DOUBLE PATENTING REJECTION HAS BEEN OVERCOME**

The dependencies of claims 16 and 17 have been amended which addresses this rejection.

### **IV. THE WRITTEN DESCRIPTION REJECTION HAS BEEN OVERCOME**

Claims 4-9, 16 and 17 were rejected as allegedly failing to meet the written description requirement when referring to the limitation "wherein no additional metallic components are present in said aluminum oxide catalyst." The applicants' request reconsideration of this rejection for the following reasons.

First, there is no requirement that a claim limitation have *ipssis verbis* support, i.e. the exact same claim language does not have to literally appear in the specification if it can reasonably be interpreted to be part of the invention and that the applicants had possession of the invention at the time the invention was filed.

Second, the applicants are entitled to claim less than what the original scope of the claims may have originally encompassed.

The specification is inclusive in scope for a process for decomposing perfluoroalkanes wherein the aluminum catalyst does not have additional metallic components present. Support for this limitation is directly and indirectly apparent from the specification.

The applicants' process is intended to be an improvement over other means of decomposing perfluoroalkanes such as those described in the "Background Art" section. One of these prior art processes was that of US Patent 6,162,957 (the '957 patent) which used metal phosphates and had transition metals in the catalyst.

Examples I-XI do not contain metallic components in the catalyst and are embodiments which support the statement on page 7, lines 17-20 that "...it is preferred to use phosphate compounds, which do not contain metal components, such as diammonium hydrophosphate  $((\text{NH}_3)_2\text{HPO}_4)$ , ammoniumdihydrophosphate  $(\text{NH}_3\text{H}_2\text{PO}_4)$  or phosphoric acid  $(\text{H}_3\text{PO}_4)$  for the catalytic activity and thermal durability." Furthermore, Comparative Example 1 was from the '957 patent and its results were compared against the results of process of Examples I-XI which did not use metallic components.

The Office action alleges that the teachings of page 7, lines 17-20 only refers to the phosphorus component and not the aluminum oxide catalyst itself. However, this interpretation is incorrect. To further explain this position, the applicants submit herewith a declaration by Dr. Yong-ki PARK who is well versed in the catalytic decomposition arts.

Dr. Park asserts that the use of aluminum oxide catalysts with additional metals were well known by the inventors (e.g. the '957 patent) and that these decomposition methods still had need for improvement. As explained in the declaration, the applicants' solution to the problem of the prior art methods was to design a process wherein the aluminum oxide catalysts were free of additional metal components. It would have been nonsensical by the applicants to claim the failures of the prior art and as asserted by Dr. Park, one of ordinary skill in the art, after considering the entirety of the specification, would have found the claimed limitation to be superfluous in light of the state of the art, the description and the examples provided in the specification.

Lastly, the final paragraph of the specification states that "...the catalyst in this invention has more advantages for commercialization since it can be prepared simply by the modification of commercially-available and environment-friendly aluminum oxide with a small amount of P

at low cost ***without the incorporation*** of expensive or toxic metallic components.” (emphasis added) which is a clear direction not to incorporate metallic components.

Given this level of disclosure provided by the applicants’ and the initial presumption that an originally filed application is adequately described, the limitation “wherein no additional metallic components are present in said aluminum oxide catalyst.” is amply supported by the specification and does not constitute new matter.

**V. THE 35 U.S.C. 103(a) REJECTION HAS BEEN OVERCOME**

Claims 4-9, 16 and 17 were rejected as allegedly being obvious over Rossin (U.S. Patent No. 6,509,511) in view of Sato et al. (U.S. Patent No. 4,791,084 - “Sato”). The applicants request reconsideration of this rejection for the following reasons.

The applicants maintain their argument from the response which accompanied the RCE amendment as the applicants are unclear as to the basis in the “Response to Arguments” section of the Office Action for maintaining the rejection.

First, the applicants’ currently pending claims are not directed toward the aluminum oxide catalysts themselves, ***but their use*** in the catalytic decomposition of exhausted perfluoro-compounds. Sato discloses an Al/P catalyst, but only in the context of using it for the cracking of hydrocarbons “with superior selectivity to gasoline”.

One of ordinary skill in the art interested in a process for the conversion of perfluoroalkanes such as those taught by Rossin and the applicants’ would not look to an unrelated process such as the cracking of hydrocarbons (i.e. the breaking down of larger saturated hydrocarbons into smaller, often unsaturated, hydrocarbons) by Sato and have any expectation of success by selecting an isolated element from this unrelated process for use in a method to convert perfluoroalkanes (to carbon monoxide, carbon dioxide and hydrogen fluoride in Rossin and carbon dioxide in the applicants’ claimed invention).

Second, the applicants’ arguments presented against the combination of Rossin and Sato were directed in part to the fact that the combination did not teach that “no additional metallic components are present in said aluminum oxide catalyst”. Regardless of whether this limitation is deemed to meet the written description requirement (which applicants argue above that the requirement has been met), the evaluation of the claims must consider all of the limitations, even those which do not find support in the specification as originally filed. *See MPEP 2143.03; Ex parte Grasselli*, 231 USPQ 393 (BPAI 1983) *aff’d mem.* 738 F.2d 453 (Fed. Cir. 1984).

As noted above, there was no reason for one of ordinary skill in the art to have used Sato's catalysts in Rossin's process and the catalysts of Rossin are clearly directed toward the inclusion of a metallic component (see e.g. col. 3, lines 53-60) much more so than the inclusion of phosphorus alone in the absence of a metallic component.

Third, the applicants have provided evidence of unexpected results in three different ways. The applicants' Comparative Example I in the specification, shows there was no expectation that a phosphorus containing catalyst would be effective for decomposition of perfluoroalkanes (an aluminum phosphate catalyst resulted in only 3% conversion of CF<sub>4</sub> – one of ordinary skill would not have expected use of Al-P catalyst to have the ability to completely convert the perfluoroalkane to carbon dioxide).

Dr. Park's declaration confirms that the decomposition activity on the perfluoroalkanes for the claimed process was unexpectedly superior and in addition, the process did not result in short lifetimes for the aluminum oxide catalyst.

In addition, the applicants' complete conversion is also surprising in that only carbon dioxide is produced. As noted in Rossin, their process resulted in a mixture of carbon monoxide, carbon dioxide and hydrogen fluoride (see col. 4, lines 42-45 of Rossin).

For any of the above reasons, the applicants' claimed process is not obvious in view of the combination of Rossin and Sato.

#### **VI. PARALLEL KOREAN APPLICATION HAS BEEN ALLOWED**

Although the applicants realize that decisions of patentability in other countries are not binding on the USPTO, the findings in other countries can be considered by the Office. The applicants note that the parallel Korean application of the present application had been considered patentable due to reasons which have substantially been given above and has been granted as KR 10-0461758.

Since the applicants' last response, the PTO commenced a pilot program for the Patent Prosecution Highway (PPH) with the Korean Patent Office (KIPO) on 28 January 2008.

#### **CONCLUSION**

In view of the remarks and amendments herewith, the application is believed to be in condition for allowance. Favorable reconsideration of the application and prompt issuance of a Notice of Allowance are earnestly solicited. The undersigned looks forward to hearing favorably from the Examiner at an early date, and, the Examiner is invited to telephonically contact the

undersigned to advance prosecution. The Commission is authorized to charge any fee occasioned by this paper, or credit any overpayment of such fees, to Deposit Account No. 50-0320.

Respectfully submitted,  
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